THE

VETERINARY JOURNAL

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OCTOBER, 1923.

Editorials

THE ROYAL (DICK) VETERINARY COLLEGE CENTENARY RESEARCH SCHOLARSHIP, AND ULSTER.

THE effort of the Governors and Staff of the Dick Veterinary College to obtain the £10,000 asked for in order to found a Centenary Research Scholarship is being well seconded by individual supporters, who are devising all kinds of schemes for netting the necessary "pelf"; but the most prominent of all is undoubtedly that of the Ulster practitioners, who have formed a Committee, of which the Vicereine (Her Grace the Duchess of Abercorn) has graciously consented to act as President, with Lady Craig, the Lady Mayoress of Belfast, the Marchioness of Dufferin and Ava, the Countess of Shaftesbury, Lady Carson, Lady Dixon, as Vice-Presidents, and a host of ladies whose husbands are well known in the profession (including Mrs. Ewing Johnston, Mrs. Ross, Mrs. McLean, Mrs. Lindsay, Mrs. McCrea) as a working committee. We understand that they have banded themselves under the most awful Irish oaths that they will not rest or sleep until the prospective scholarship is benefited by at least the sum of one thousand pounds! Books of 20 shilling tickets, allowing the owner to participate in sweepstakes for every variety of thoroughbred veterinary patient (ranging from a thoroughbred hunter and a cow, to a dog, sheep, pig, pair of guinea-pigs, and even a canary), are to be obtained by post upon application from Mr. Ewing Johnston, Jun., at "Tally Ho," Strandtown, Belfast; and recently, at a well-

attended meeting in the Lord Mayor's Parlour, Belfast, Her Grace the Vicereine herself stated that, " If they all did their best, there could be no doubt as to the result, for the Belfast and Ulster people invariably achieved the object they had in view."

The Hon. Mrs. Herbert Dixon proposed, and the Lady Mayoress seconded, the following resolution, which was unanimously passed: " That this meeting of the President, Vice-Presidents and Committee of the Ulster Section of the Edinburgh Bazaar are greatly gratified to learn that it has been decided to organise an Ulster Stall in connection with the project. We hereby express our hearty sympathy with the movement, and undertake in every way in our power to further the object in view by contributing or collecting donations of money, work, or other saleable articles, so as to ensure the success of our particular stall and make it worthy of the province whose name it bears and whose interests we at all times desire to serve."

Mr. J. Ewing Johnston, M.B.E., M.R.C.V.S., proposed a hearty vote of thanks to the Ulster Vicereine. The use of the Duchess's name, he said, had undoubtedly given a great stimulus to the object they had in view.

The motion was enthusiastically passed, and a similar compliment, on the proposition of the Duchess, having been accorded the Lord Mayor for granting the use of the parlour, the proceedings concluded.

THE BENEFICIAL EFFECT OF THE EIGHT-HOUR DAY ON THE OCCURRENCE OF COLIC IN HORSES.

THE short editorial on the above subject in the August issue has brought a considerable amount of correspondence forward, the writers being in almost unanimous accord with the statements that colic is much less frequently seen than it used to be, and also that work and fatigue are decidedly the commonest predisposing causes.

Probably no one has produced more statistics or taken more trouble over this subject than Major-General Sir Frederick Smith, who, as long ago as May 1893, wrote an article in the *Veterinary Record* entitled " The Influence of the Time of Day on the Production of Colic." In this article Sir Frederick Smith, with his usual minute attention for accurate details, specified hour by hour the respective number of animals admitted to hospital with colic; and he particularly drew attention to the fact of the complete absence of this ailment from the Remount Depots where the animals had no work and only a very little exercise, with diet accordingly. In his standard work, too, on Veterinary Physiology, this indefatigable writer asserts: " Apart from such obvious explanations as errors in feeding, the most common cause of derangement of the muscular

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action of the bowel is work. It is this which accounts for the majority of colic cases occurring at the end of the day; for the frequency with which the seizure occurs at, or shortly after, work, especially that of an exhausting nature; and for the practical absence of colic amongst non-working horses."

Statistics all prove the truth of the above statement, and the Eight Hours' Bill has had its beneficial influence, probably to a much greater extent, on the animal world even than on that of man.

THE INTEREST OF THE LAY PRESS IN THE DISTEMPER QUESTION.

At no time in the history of the profession has there been so much interest displayed by the lay Press in the question of the diseases of animals, and the recent continued series of articles on Distemper, together with the subscription list which has been opened, in the columns of the *Daily Telegraph*, are definite evidence. Money is an essential necessity, unfortunately, for any big research; and as the subject of an animal disease, such as distemper, is a veterinary matter, it behoves the members of our profession to stimulate their clientèle, and the public generally, on every possible occasion, to assist and to add their efforts to those which are being made to discover a preventative or cure for this terrible disease of dogs; which will possibly carry in its train benefits not only to the dog but to man himself.

PAYMENT OF PROFESSIONAL FEES AT SHOWS.

On several occasions the question of an adequate remuneration for services rendered as Veterinary Inspectors at Shows has been raised, but although opinions are practically unanimous that a professional man should remain within call for the whole of the time a show lasts, no official stand has been taken to assure the payment of an adequate sum as a fee to compensate for loss of time.

The subject has been recently brought up by a layman (no less an authority than Mr. Charles Hopton, the Kennel Editor of *The Spur*), and this writer says emphatically that "no one can expect a veterinary surgeon to give his whole time at a show for nothing"; and, after recording an instance where sundry very valuable dogs narrowly escaped distemper at a well-known show (entirely owing to the fact that the veterinary inspection was somewhat hurried and superficial), he says: "Since that time I have never ceased advocating that a competent veterinary surgeon should be employed, and adequately paid, to continually make the rounds."

The Spur is a well-known sporting and country gentleman's paper published in the United States of America.

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All that is wanted in this, as in the question of the improvement of whole-time Government salaries, is unanimity in a decision to act up to the motto that " the labourer is worthy of his hire." We do not sufficiently realise this, nor do we fully realise our value, and the fact, also, that without our profession and its knowledge the whole question of the continuance of animal breeding and stock raising would soon be in a state of chaos.

It is a subject which might with advantage to the profession be presented to the National Veterinary Council; and even although this Body might not be able to enforce its opinion legally, a ventilation of the moral aspect of the question might act as a guide to those of the younger generation who have not yet realised all the difficulties of their future career.

General Articles

THE PANCREAS AND INSULIN.

By E. Morgan, F.R.C.V.S., D.V.S.M.
Puerto Cabello, Venezuela.

Formerly slaughterers and packers paid no attention to recovering the glands from animals slaughtered. For many years but one or two packers recovered this by-product. Of late years the use of animal glands for medicinal purposes has increased tremendously, and manufacturers of pharmaceutical products are eager to buy all the glands offered.

It is not a difficult matter to save most of the glands on the killing floor or in the cutting room, but to obtain them properly there should be some preliminary instruction, and care must be used by employees in handling them.

Recently an important new discovery has been made in which glands figure. As a cure for diabetes, insulin is the remedy, and insulin is prepared from the fresh pancreas of swine and cattle, being found in a very small endocrene gland which is contained in the larger pancreas gland.

Effort has been made to separate this small gland but without much success, and the whole pancreatic gland is used by manufacturers, thus creating a very large demand for the product, as it requires large quantities for a single dose of insulin. Technical information on this point comes from G. Van Gelder of Amsterdam, Holland, an authority in this field, who writes to *The National Provisioner* of Chicago (July 7, 1923) as follows: " Readers will no doubt be interested to know that in the pancreas, an endocrene gland by itself, are found the Langerhaus islands (corpus Langerhaus), small endocrene glands measuring from 0·04 to 0·2 mm. One corpus Langer-

haus is found on $\frac{1}{3}$ mm. of pancreas tissue, and it is these endocrenes in an endocrene gland which are wanted to cure sufferers from diabetes.

"We have tried to cut the Langerhaus islands from the other pancrean tissue by using a double table, the upper blade containing a strong microscope. Our endeavours have not met with success, because the time used for cutting out the Langerhaus islands is in no proportion to the price obtained for the tissue.

"Manufacturers are using the whole fresh gland, and large quantities are required to prepare even one dose of insulin."

HYPODERMA BOVIS (DE GEER) AND *H. LINEATUM* (DE VILLIERS) CAUSING WARBLES IN HORSES

By A. W. Noel Pillers, F.R.C.V.S.,
Liverpool.

Whilst recently examining a warble from a horse I was impressed by its close resemblance to *Hypoderma bovis* of the ox. On looking up the subject in Neumann * I found the following statement, which to my mind seems to convey the generally accepted view amongst veterinarians in this country:—

> "Joly, by reason of these particular characters, looks upon it as a distinct species, which he designates *Hypoderma equi*. Brauer, however, is inclined to think it is identical with *H. silenus*. But the question is still undecided, as it has not yet been possible to ascertain the nymphosis of these larvæ, nor yet has the perfect insect been found."

Apparently the larvæ mentioned in the above quotation are sometimes referred to as *H. loiseti*. Several text-books list *H. bovis* as occurring in man and horses; there are also other records. Carpenter † found *H. bovis* in the horse in Ireland. Cooley ‡ likewise records *H. lineatum* in horses in the United States. Seymour Jones § states that the horse is the only animal known to have been infested with three species of *Hypoderma*, viz. *H. bovis*, *H. lineatum*, and *H. diana* (usually found in deer), but that such cases are rare.

On the other hand, references to *H. equi* or *loiseti* in recent works are very rare. As further examination of the specimen mentioned

* Neumann-Macqueen: *Parasites and Parasitic Diseases of the Domesticated Animals*, 2nd Edition, London, 1905, p. 50.

† Carpenter, G. H.: "Injurious Insects and Other Animals observed in Ireland during 1913." *Econ. Proc. Royal Dublin Soc.*, II, No. 9, July 1914, p. 142.

‡ Cooley, R. A.: 18th Annual Report, State Entomologist, Montana Agric. Exper. Station, *Bozeman Bulletein*, 139, January, 1921, p. 15.

§ Seymour Jones, A.: "Warble Flies and their Maggots in Cattle." *Leather Trades Year Book*, 13th Edition, London, 1921, p. 169.

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showed that it was *H. bovis*, I submitted seven larvæ taken from the backs of horses at Abbeville and St. Omer (France), Monaghan (Irish Free State), Burscough (Lancs), Leighton Buzzard (Beds), and Lechlade (Glos), to Mr. W. H. Potts, B.A., of the Liverpool School of Tropical Medicine, who kindly examined them, and found that five were *H. bovis* and two *H. lineatum*. The distinguishing characters are given by Laake * whose work is unfortunately made somewhat confusing by the insertion of a description of a new stage between what is usually regarded as the first and second instars. He thus gives five stages instead of the usually accepted four. When suitably treated by boiling in caustic potash solution, by dehydration, by clarification in clove oil, and examined after mounting in Canada balsam, the mouth-hooks present, under the high power, distinctive features (Fig. 1).

In most of the animals from which the above larvæ were taken only one warble occurred in each host, usually somewhere upon the dorsal aspect of the trunk. In one case, however, which was

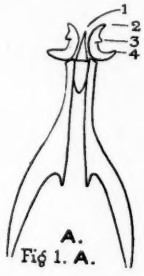

Fig 1. A.

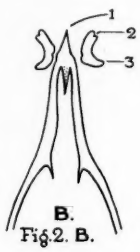

Fig 2. B.

FIG. 1.—MOUTH-HOOKS AND CEPHALO-PHARYNGEAL SKELETON OF THE LARVÆ OF (A) HYPODERMA LINEATUM AND (B) HYPODERMA BOVIS.

1, Spine; 2, Anterior Extremity of Mouth-Hook; 3, Posterior Extremity of Mouth-Hook; 4, Tooth. Greatly enlarged (after Laake).

encountered by Mr. J. R. Baxter, M.R.C.V.S., of Lechlade, Glos, at least eleven larvæ were found in positions indicated in Fig. 2. Only one of the grubs was examined: it was *H. bovis*. The following is a brief clinical account of the case. The animal, a hunter, was examined for soundness at purchase on December 4, 1922. He was then in excellent condition and no warbles were seen. On January 12, 1923, a few patches of ringworm appeared, and soon after this a lump became visible on the saddle region just behind the withers. This was thought to be due to pressure as the animal had been carrying a side-saddle. Other centres then began to

* Laake, E. W.: "The Distinguishing Characters of the Larval Stages of the Ox Warbles *Hypoderma bovis* and *Hypoderma lineatum*, with a Description of a New Larval Stage." *Jour. Agric. Research, Washington*, D.C., vol. xxi, No. 7, July 1, 1921, p. 439.

develop, condition was lost, and the action became less free. This state of affairs continued until March 12th, when he appeared quite free and was doing well. In May, however, three more centres developed, but these cleared up quickly. It is thought that there were actually more warbles than those shown in the sketch, but infiltration was marked, especially upon the saddle region, and apparently some centres coalesced.

The above facts seem to suggest that perhaps *H. bovis* and *H. lineatum* are the usual causes of warbles in horses, and that *H. bovis* at least is capable of causing lesions requiring treatment. The horse would, however, hardly be a host for serious consideration

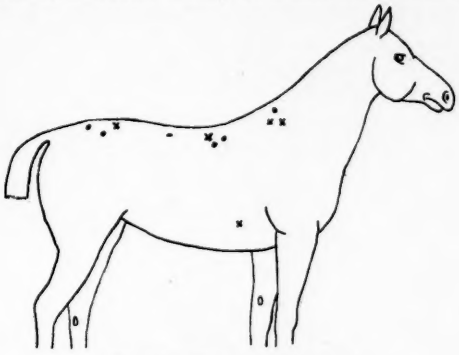

FIG. 2.—EQUINE WARBLES.
The spots represent warbles on the near side and the crosses those on the off side.

in a campaign against these flies. MacDougall * has recorded damage to deer hides, due to *H. diana* in Scotland, and it would be interesting to know whether the warbles of horses near deer forests are due to this species.

NOTES ON BUFFALO: ANATOMY, PATHOLOGICAL CONDITIONS, AND PARASITES.

BY A. E. CAMERON, V.S.,
Animal Pathologist, Veterinary Research Station, Lethbridge, Alta.

AT the National Buffalo Park, Wainwright, the famous herd of over 7,000 head of buffalo were being reduced by 250 as a commencement in retarding the rapid increase. The original herd of something over 700, purchased by the Canadian Government in Montana in 1907, now amounts to over 7,000. While these buffalo were being killed, in February 1923, the writer attended to note any pathological conditions

* Macdougall, R. S.: "Insect Pests in 1914." *Trans. Highland and Agric. Soc. of Scotland*, 1915. Reprint.

on instructions from the Veterinary Director-General, Dr. Torrance. The work was done in co-operation with Dr. S. Hadwen, of the Parks Branch, and Inspector Christian, of the Meat and Canned Foods Division, and thus a more complete examination was made than would otherwise have been possible.

The buffalo were shot and bled in the open, and the carcasses were brought to the abattoir, built for the purpose, to be dressed. This was done with care owing to the value of the hides. The heads were handled so that they could be mounted. These magnificent heads, many with horns well over 2 feet between the tips, have a very thick covering of hair. When stretched out many of these hairs measure over a foot long. Behind the forearm also the hair is of equal length, but straighter and so appearing longer. The hide generally is thicker than in cattle. In the one case in which a castrated buffalo was dressed the skin was comparatively thin, its whole appearance was much the same, in relation, as a steer, the horns were longer, thinner, and much resembled those of the ox.

The buffalo killed were mostly bulls well up in years. They were not fat, and the average weight of the dressed carcass was just under 700 lb. The meat is coarse looking, the muscle bundles being very large. The sides when hanging have a very noticeable intercostal tendinous tissue.

Thirteen years ago when the herd was brought to the Park many of the bulls were old then. They are wild, and no definite information has been obtained as to the relation of the teeth to age. The incisor teeth are remarkably strong, and do not appear to be worn down so quickly as in the ox. Of 88 head examined, only two were seen with incisor teeth missing. In one case two were gone, in the other only a row of stumps were left. Buffalo reputed to be anything up to thirty-five years old had all the incisor teeth present. There was a distinct table in many—such as would be expected if the teeth were in apposition to upper teeth. One buffalo said to be four years old had only two permanent incisor teeth, while one said to be six years had four. The molar teeth, while larger, are similar in structure to those of the ox, but the table is not so uneven, and resembles that of the horse.

The tongue is more pointed than the tongue of the ox, and the tip is black for from 2 to 3 inches to right back to the prominence of the dorsum, with occasionally a black spot on the back portion. The papillæ resemble those of the ox.

The hard palate is black in front, and sometimes this colour extends back at the sides, giving the appearance of a white spot in the middle. The bars are prominent and deep, and while on the average straight, frequently have short bars at the sides, with occasionally two on the

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one side merging into one bar on the other side. At the posterior end the bars do not always stretch straight across but alternate at the centre. On the dental pad are short blunt papillæ, and the papillæ on the bars are larger than those of the ox, and separated by deeper divisions into lots of two, three, and even four papillæ.

The buffalo has fourteen ribs, and the chest measured as the carcass lay on its back, before being skinned, was 41 to 51 inches in diameter from the withers to the sternum. The longest spinous process of the thoracic vertebræ (the third) averaged 18·4 inches. Ten were measured, the range being from 16 to 20 inches.

The trachea is very large, the ends of the cartilaginous rings being widely separated, the space becoming narrower from the larynx to the lungs. One windpipe measured at its widest part 4¼ inches from side to side and 2½ inches deep. The connective tissue joining the ends of the cartilages measured 4 inches at its widest point. The heart, liver, spleen, and kidneys were weighed, and have about the same relation to body weight as those of the ox.

The heart averaged 6·38 lb.—thirteen were weighed—the range being from 5¼ to 8 lb.

The spleen averaged 2·71 lb.—fourteen were weighed—the range being from 2 to 3½ lb.

The liver averaged 10·56 lb.—twelve were weighed—the range being from 9½ to 12½ lb.

The gall bladder was found to be double in nearly 7 per cent. of those examined. Of six examined, two had two ducts, one for each gall bladder, while four had one duct, the bladder itself being divided into two sacs after the entrance of the bile duct.

Three pairs of kidneys were weighed, being 1¼, 2½, and 3½ lb., respectively.

The kidneys differ from those of the ox. The outer surface is smooth and flat, while fissures pass deeply into the substance of the organ, dividing it irregularly. One lobe in the centre is five-sided. Fibrous tissue passes from the capsule into the fissures, and when the capsule is removed the divisions appear like incisions, the edges of which are not rounded as in the ox.

Pathological Conditions.

Teratoma.—A dermoid cyst was found located at the side of the anus of a buffalo. This was about the size of a small orange and half filled with a brownish black liquid, the pigment of which resembled melanin. The other half was filled with a sebaceous material containing short white hairs. The lining membrane had numerous hair follicles with hair entirely enclosed.

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Lipoma.—A small fat tumour was found located inferiorly to the xiphoid cartilage. This was about 2 inches in diameter, and appeared to have no pathological significance.

Arterio-sclerosis.—Inspector Christian found the posterior aorta in a very old buffalo bull affected with this condition. The anterior aorta appeared healthy. This large vessel was found to be only 1 mm. thick in places, its elasticity was entirely gone, and the inner side appeared divided into thin plates from an eighth to a half-inch in diameter ; these were thin and brittle. The smaller vessels appeared normal.

PARASITES.

Hypoderma larvæ were encountered in the œsophagus, the pillars of the diaphragm, between the spleen and the stomach, in the spinal canal, and in the hide. One somewhat damaged specimen was secured from the hide, an old larva which had remained in the hide from the previous year, and was, of course, dead. Practically all the buffalo were infested with these larvæ.

Setaria labiato-papillosa.—This parasite of the serous membranes was found in every buffalo examined in the peritoneal cavity. As many as thirty were counted in a single buffalo. Little appears to be known about these worms, but from the specimens obtained they seem to cause some lesions which are harmful. In infested buffalo small adhesions were frequently noted, and in some cases the parasite was entangled in the adhesions. When these setaria die they become surrounded by inflammatory tissue, which later becomes caseous in appearance and eventually hard. This encased worm is practically detached from the organ or mesentery, and may be found free in the abdomen as a smooth pearl-like mass. The outline of the worm still shows in some of these, while in some, presumably older ones, it seems to be entirely disintegrated. Specimens were obtained showing the gradual encasing of the worm after death. When the abdomen of the buffalo was opened these loose " pearls " sometimes dropped on the floor of the abattoir, and were found to be about $1\frac{1}{2}$ inches long and about $\frac{1}{2}$ inch broad and quite flat.

Fasciola Magna.—This fluke was found in several of the livers examined, the first being secured by Dr. Christian. The presence of these trematodes was readily noticed by the inky black areas showing on the surface of the liver. When opened the areas around the flukes were friable and had deposits of pigment, like melanin, of a brownish-black colour.

Hæmonchus ostertagi was found in the fourth stomach and in the duodenum. The male, 8 mm., and the female, 14 mm., are not readily found unless a careful search is made, but they are accompanied by

inflammation of the mucous membrane, and appear to cause the same trouble as in cattle.

Dictyocaulus Filaria.—These lung worms were found in several cases. The male measured 3 cm. and the female 5 cm. In the specimens collected the males exceeded the females. The lesions associated with these worms were emphysema and hard areas which suggested tuberculosis when felt from the outside. The numbers found in a single buffalo were comparatively few, about a dozen.

From the intestines the following parasites were secured :—

Moniezia species not definitely identified, but probably *planissima.* These were found in about 3 per cent. of those examined. These tapeworms were not numerous enough to cause much trouble.

Esophagostomum, species not yet identified. The adult worms appeared to be more numerous than the nodules seen.

KIDNEYS OF THE NORTH AMERICAN BUFFALO (BISON).

Besides the above parasites, an *Echinococcus cyst* (doubtful) was found in the liver, an accident in rupturing the cyst probably accounted for microscopical examination being unsuccessful. Dr. Hadwen is of the opinion that this cyst was *Echinococcus.*

Sarcocystis.—Miescher's sacs were found in the pillars of the diaphragm, and sarcocysts were also found in many of the hearts examined situated under the endocardium. The latter were very small and difficult to detect unless specially looked for. Those in the pillars of the diaphragm were much larger, being at least four times as long as the sarcocysts in the heart. When stained the *sarcosporidia* showed as sickle, oval, or round-shaped spores, as usual.

External Parasites.—Although careful search was made, no lice or other parasites of the skin were found.

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No cysts of the human tapeworms were found. To prevent this there is a closet in the stable for use of the men employed, and the excreta is properly disposed of. Coyotes are hunted systematically, so that the risk from canine parasites is reduced.

The writer desires to acknowledge the assistance and facilities given by the Superintendent of the Park, Mr. Smith, which enabled a close examination to be made.

SOME FURTHER OBSERVATIONS ON THE TUBERCULIN TEST

By J. F. D. TUTT, M.R.C.V.S., F.L.S., F.Z.S.,
Winchester.

In the Veterinary Journal for February 1922 (pp. 52–56), I discussed some observations on the different tuberculin tests, and as I have since then tested a large number of cattle, some further observations may be of more than passing interest.

Subcutaneous Tuberculin Test.

This is, I think, the most reliable test as a primary one for adult cattle not tested before, but it is at the same time one where most error is likely to occur.

I do not consider it a reliable test for young cattle, as their temperatures normally are often variable and high, and readily rise from external causes such as excitement; nor is it always reliable in show cattle that are being heavily fed, and in heavy milking cattle in receipt of a high nitrogenous diet; and it is not a good test to apply in show and sale yards where the animal is in a strange environment.

Under present Grade A Regulations temperature recording has to start at the 6th hour after inoculation, and continued at 3-hour intervals up to the 18th, and continued to the 21st, if a previously uniform reading shows a tendency to rise at the 18th hour.

Everybody's experience may not be the same, but from the results given in animals that I have tested, and which reacted, the 6th hour reading has been of no practical use whatever. True, here and again, a rise has been noticeable at the 6th hour, but the definite rise constituting the tubercular reaction has in many cases not occurred until the 12th hour or even later, and occasionally at the 9th hour. The thing that stands out most noticeably is the fact that where a reaction has occurred before the 12th hour, it has also been present at the 12th, and often persisting later. The 9th hour would appear to be quite early enough to start recording, and the 21st the earliest at which to stop. I have heard of one case where a reaction was

only observable at the 6th hour, but these cases must be exceedingly rare.

As a general rule for sale and export purposes, temperatures have for years been taken at the 12th to 21st hours only, and in my experience these results have been most satisfactory.

In testing large herds, multiplication of temperatures only adds to the work of the practitioner, and adds nothing to the ultimate decision, and the too frequent recording is making the test a farce. The following records are of interest in this connection, where temperatures were taken from the 3rd to 24th hour :—

BREED—NON PEDIGREE SHORTHORN MILK CATTLE.

Name.	A.I.	3rd.	6th.	9th.	12th.	15th.	18th.	21st.	24th.
Bluebell	102·2	102·8	103·0	104·4	105·4	105·0	105·2	103·2	102·6
Lucky	102·6	102·2	102·4	103·2	103·0	103·6	103·3	102·8	102·6
Peggy	101·6	100·8	101·8	103·0	105·2	105·0	104·5	104·2	103·6
Dorothy	101·4	101·7	102·4	102·8	104·0	103·3	102·0	101·6	101·4
Nancy	101·9	101·6	101·4	103·8	105·6	105·1	103·8	105·4	105·0
Sally	102·2	101·4	103·0	105·0	105·8	104·7	104·2	103·8	103·2
Bull	102·6	103·2	102·4	102·6	104·8	104·6	103·2	102·9	102·6

These are taken at random from a herd of 39.

REMARKS.

Bluebell.—The rise starts at the 6th hour, and the maximum is reached at the 12th hour. There is a gradual drop until the 24th hour, when the temperature is still 0·4 degree more than at inoculation.

Lucky.—Has a very unsatisfactory reading, i.e. "jumpy," throughout, and although the classical rise of 2 degrees has not taken place, it is a very suspicious reading, and classes her as a "doubtful reactor." In view of similar cases, I should now have no hesitation in classing her as a "reactor."

Peggy.—The greatest rise is at the 12th hour, and even at the 24th hour her temperature was 2 degrees higher than at inoculation.

Dorothy, Nancy, Sally, and the Bull.—In each case the maximum reading is at the 12th hour. It is interesting to note the persistence of the high reading in the case of *Nancy*.

It will be seen that in none of these cases was the 3rd, 6th, or 9th hour records of much value.

Two rather erratic readings were given by two cows that were suspected of tuberculosis, but which on post-mortem were found to have Johne's disease :—

No.	A.I.	3rd.	6th.	9th.	12th.	15th.	18th.	21st.	24th.
1	104·6	103·4	102·0	102·0	102·6	103·6	101·8	102·8	103·0
2	102·0	101·2	101·8	101·4	101·1	101·4	100·2	102·0	103·4

In No. 1, of course, the 104·6 at inoculation temperature was really far too high to expect satisfactory results, but it had been her normal reading for some days beforehand.

That the 2 degrees' rise is not always present in cases of tuberculosis is shown in the following table, each case being supported by post-mortem evidence of tuberculosis :—

No.	A.I.	9th.	12th.	15th.	18th.	21st.	Lesions.
1	102·2	104·0	102·4	102·2	102·0	101·8	Pulmonary
2	102·4	103·4	103·0	102·8	102·0	102·0	ditto
3	102·2	104·0	103·8	103·4	102·6	—	ditto
4	101·6	103·0	102·6	102·2	102·2	101·7	ditto
5	101·8	103·4	102·4	103·2	102·5	102·4	ditto
6	101·6	103·4	103·2	103·0	102·6	101·8	ditto
7	101·6	103·2	102·8	102·8	102·8	101·8	ditto
8	101·8	102·0	103·4	101·4	101·0	—	ditto
9	101·8	103·6	102·1	102·0	101·8	101·2	ditto
10	102·0	102·8	103·0	103·8	103·6	—	ditto

Reliability of the Test.

As already stated, this test is very liable to lead to error, unless carried out with the greatest care. The usual rise of 2 degrees in cattle affected with tuberculosis is by no means constant, and a temperature that varies considerably—even if not rising as much as 2 degrees—should be regarded with suspicion and the cow regarded as doubtful until another re-test is carried out.

As a comparison with the Ophthalmic and Intradermal Tests, the following results in ten South Devon cattle with the three tests, is of interest :—

Name.	Age.	Ophthalmic.	Intradermal.	Subcutaneous.
Keepsake	5	Passed	Doubtful	Definite Reactor
Iona	7	Doubtful	Doubtful	Doubtful
Fancy	5	Reactor	Reactor	Doubtful
Cowslip	7	Passed	Reactor	Reactor
Jewel	6	Passed	Doubtful	Passed
Princess	6	Reactor	Reactor	Reactor
Duchess	9	Reactor	Reactor	Reactor
Beauty	6	Reactor	Doubtful	Passed
Judy	6	Reactor	Doubtful	Reactor
Brighteyes	3	Passed	Doubtful	Passed

Date of Ophthalmic and Intradermal Tests.—July 1 to 8th, 1922.
Date of Subcutaneous Test.—November 2nd to 3rd, 1922.

Remarks.

Keepsake.

This cow was tested simultaneously (as were all the others) with Ophthalmic and Intradermal Tuberculin during the period July 1–8th, 1922. The records were :—

(*a*) *Intradermal.*—A small pea-like swelling at the 18th hour, which had increased at the 24th hour. At the 72nd the reaction was doubtful, and at the 90th very weakly positive, and it was regarded as doubtful.

(*b*) *Ophthalmic.*—No reaction at all.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·0	104·0	105·2	105·0	103·4

Definitely reacting to the test.

Iona.

(*a*) *Intradermal.*—A very small pea-like swelling was observed at the 24th hour, with tenderness at the 48th. Slightly weak positive at the 90th.

(*b*) *Ophthalmic.*—A very weak and indefinite reaction at the 24th, 48th, and 72nd hours; regarded as doubtful.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·4	102·6	103·0	102·6	102·6

No 2 degrees' rise took place, but in view of the other tests the cow was regarded as tubercular and removed from the herd.

Fancy.

(*a*) *Intradermal.*—A small pea-like swelling at the 24th. Considerable swelling at the 48th. Still weakly positive at the 72nd and 90th hours.

(*b*) *Ophthalmic.*—Conjunctivitis at the 18th hour. Pus at the 24th, and considerable hyperæmia of the conjunctiva. Strongly positive at the 48th and 72nd hours, and weakly positive at the 90th.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·6	103·2	102·8	102·0	102·6

Although not a definite reaction, the temperature is a "jumpy" and unsettled one; and although doubtful, the cow was undoubtedly Tubercular, in view of the strong reactions to the Ophthalmic and Intradermal, and I had no hesitation in condemning her.

Cowslip.

(*a*) *Intradermal.*—A pea-like swelling at the 38th hour, general swelling at the 24th. Tenderness at the 48th. Swelling very much larger at the 72nd hour, and a strongly positive reaction at the 90th hour.

(*b*) *Ophthalmic.*—Weak reaction at the 24th hour only, but such that it could not be regarded as one.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·0	100·6	101·0	102·0	102·8

XUM

Not a definite result, but the rise is persistent ; and although not above 102·8, the cow was undoubtedly affected, and she was condemned, the definite intradermal result, of course, being taken into consideration.

Jewel.

(*a*) *Intradermal.*—A small pea-like swelling at the 18th hour, general swelling at the 24th, and tenderness at the 48th, very weakly positive at the 72nd and 90th hours.

(*b*) *Ophthalmic.*—Negative.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·7	101·4	101·4	102·0	102·8

Although no 2 degrees' rise, and a " pass " under normal circumstances, there is a distinct rise, and the cow was removed from the herd. The Intradermal here helped the decision.

Princess.

(*a*) *Intradermal.*—General swelling at the 24th, with tenderness at the 48th, strongly positive at the 72nd and 90th hours.

(*b*) *Ophthalmic.*—Pus at the 18th and strongly positive (conjunctivitis, pus, etc.) up to and including the 90th hour.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·6	105·0	105·0	104·2	104·2

Duchess.

(*a*) *Intradermal.*—Small pea-like swelling at the 18th, general swelling at the 24th, with a small necrotic mark at the point of inoculation ; at the 48th hour the reaction was weakly positive, but strongly positive at the 72nd and 90th hours.

(*b*) *Ophthalmic.*—Pus at the 18th. Weak reaction at the 24th. Strong reaction at the 72nd and 90th hours.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·5	103·6	105·2	104·2	104·0

Beauty.

(*a*) *Intradermal.*—Weakly positive at the 72nd and 90th hours.

(*b*) *Ophthalmic.*—Conjunctivitis and pus at the 18th, strongly positive up to and including the 90th hour.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·0	101·6	102·8	102·6	102·2

Judy.

(*a*) *Intradermal.*—Weakly positive at the 90th hour only.

(*b*) *Ophthalmic.*—Pus at the 18th hour, strongly positive up to and including the 90th hour.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·6	101·4	102·2	103·2	104·0

Brighteyes.

(*a*) *Intradermal.*—General swelling at the 24th hour. Tenderness at the 48th. Weakly positive at the 72nd and 90th hours.

(*b*) *Ophthalmic.*—Negative.

	A.I.	12th.	15th.	18th.	21st.
(*c*) *Subcutaneous.*—	101·8	101·0	101·6	102·0	102·4

An interesting reading was given in the case of a Hackney mare that on post-mortem was found to be suffering from generalised tuberculosis :—

A.I.	12th.	15th.	18th.	21st.	24th.	48th.
102·0	102·4	101·4	102·0	101·3	101·0	100·2

This case will be described in my article on "Three Cases of Equine Tuberculosis."

The Ophthalmic Tuberculin Test.

This test is one whose merits have still to be ascertained, and I am convinced that to obtain anything like satisfactory results the eyes must be sensitised before the actual test proper is carried out. It is perfectly useless to apply Ophthalmic Tuberculin and to start recording in 6 to 9 hours after, nor is it reliable when used simultaneously with the Subcutaneous, but with the Intradermal it can very well be carried out, and these two tests seem the best where large herds have to be tested.

The following table of comparative results is of interest :—

Herd No. 1.—50 tested. 25 reacted, of which 4 reacted to the Ophthalmic only, 6 to both Ophthalmic and Subcutaneous, and 12 of which were doubtful to the Ophthalmic only.

Herd No. 2.—40 tested. 10 reactors, 2 reacted to the eye only, and 8 to the Subcutaneous only.

Herd No. 3.—31 Tested. 2 reactors, both of which were Ophthalmic only.

Herd No. 4.—40 Tested, 7 reactors. 6 reacted Ophthalmically and also to the Subcutaneous. One Subcutaneous (constituting the 7th reactor) had no Ophthalmic reaction.

Herd No. 5.—106 Tested. 20 reactors, 10 of which were Ophthalmic, and 5 of which also reacted to the Subcutaneous.

SUMMARY.

Reacted to Ophthalmic only.	Reacted Subcutaneously.	Reacted to Both.
19	22	17

Where a reaction to the Ophthalmic only was obtained, it was very pronounced in all cases; but it would appear from the results that on the whole the Subcutaneous proved the most reliable, and usually picked out those that reacted to the Ophthalmic.

XUM

The Ophthalmic Test is perhaps the most difficult of all to rightly interpret, and a lot has undoubtedly yet to be learnt about it and doubtful reactions are frequent.

To apply the tuberculin, various ways are in vogue :—

(*a*) *Disc Method.*—Here the Tuberculin is put up in tablet form, and the tablet is inserted under the lower lid near the nasal canthus, and the eyelids kept closed until it has dissolved. I do not consider this method, although it is popular abroad, at all satisfactory. The tuberculin seems to lose its strength and efficacy when put up in this manner.

(*b*) *Direct Instillation.*—This is the best way, and the tuberculin can be dropped in off a glass rod or pipette. The lids are kept closed and gently rubbed to distribute the tuberculin.

A typical reaction is always accompanied by pus, and no doubt any reaction accompanied by pus, however small, is a tubercular one. The term muco-pus is liable to lead to error, as many normal eyes have an accumulation of mucus, that may easily in a tested eye be regarded as muco-pus. Pus pure and simple is the best term to use, and any discharge that is not distinctly pus may be safely dismissed unless accompanied by hyperæmia of the conjunctiva.

The pigmentation of the eye of the cow varies considerably, and wherever possible, for this reason, observations should be made in daylight. Unless the eye has been sensitised, it is no use starting to look for pus 6 hours afterwards. The 18th is early enough, and should be continued up to the 48th or later.

Intradermal Test.

This is a test that is rapidly gaining in popularity, and as it is credited with a high degree of accuracy, and in view of its simplicity it seems the test to use on large herds.

It rarely seems to miss detecting a tubercular cow, and in some extensive tests carried out in conjunction with Professor Dreyer and members of the Medical Research Committee, it was found very accurate indeed.

The most favourable time for observation is between the 60th and 90th hours, but reactions have been observed as early as the 12th and 18th, and can be followed up until the 90th hour and even later.

The usual site of inoculation is in the skin of one of the anal folds, but it would appear that a better place is on the side of the neck or on the shoulder. Here the swelling is sometimes very large, and much larger than seen in the anal fold. Usually a small pea-like swelling can be distinguished as early as the 12th or 18th hour,

and this in the case of a tubercular cow increases in size. In other cases the swelling later appears to be more or less general and of an œdematous nature. Owing to the fact that the anal folds are by no means always uniform normally in size, this must be carefully noted beforehand, and for this reason I think the neck or shoulder site for inoculation is to be preferred.

Where this is not done, accurate measurements should be made by means of calipers.

Occasionally at the site of inoculation a small red or necrotic patch, more or less circular, is observable—usually at the 24th to 48th hour. Some stress has been laid on this by Continental workers, but I am inclined to think that it has little or no bearing on the reaction at all, and is more or less of the nature of a traumatism, although a definite reaction may and has often occurred later, as it is absent when the injection is made elsewhere than in the anal fold.

Is the Tuberculin Test Reliable?

No one contests that the test is infallible, but properly carried out the errors should be more or less negligible. We all know of cases where an apparently tubercular cow reacts, and on post-mortem no lesions are found, and again where there has been no reaction, and yet post-mortem has revealed tuberculosis. The tuberculin is often blamed for these results, but these things are bound to occur now and again, and no satisfactory explanation can yet be made to account for it.

The only satisfactory way to decide the accuracy of the test as a whole and the relative merits of the different tests is to post-mortem wherever possible; and it seems a pity that all cattle destined for slaughter could not as a general rule be tested beforehand. In this way much valuable information would be gleaned.

THE RELATION OF INTERNAL SECRETION TO REPRODUCTION AND GROWTH IN THE DOMESTIC FOWL

I

Effect of Thyroid Feeding on Growth Rate, Feathering, and Egg Production.

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AND

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Paper from the Animal Breeding Research Department, The University, Edinburgh.

Since interest in the rôle of the internal secretion was first awakened by the researches of Brown Séquard, Murray and Schafer, a variety of clinical manifestations have given rise to the belief that sexual

development in Vertebrates is intimately related to the activity of one or other of the ductless glands. Both from the standpoint of pure and applied physiology it is of the utmost importance that such indications should be brought into relation with experimental inquiry, and with this end in view researches on the part played by internal secretion in relation to the reproductive cycle of the domestic fowl have been initiated at the Animal Breeding Research Department.

One of such investigation forms the subject of a remarkable account recently published by Horning and Torrey, who describe hen-feathering in Rhode Island Red cockerels through the action of thyroid feeding. These authors state that the phenomenon does not occur in castrated individuals, and they attribute the result in all probability to a stimulation of the lutear or intertubular tissue of the testis, supposed by Morgan to persist throughout life in the henny-feathered varieties. It was partly with the object of testing this conclusion that the present experiments were started. Records referring to other particulars, including growth, egg-size, and sex-ratio of offspring, were also kept, to ascertain how far the disturbance in metabolism induced by thyroid administration might influence developmental and reproductive activity in other directions. The salient particulars are herein set forth.

Materials.

The materials used for the experiments on thyroid feeding to chicks consisted of the F_1 generation of a Rhode Island Red ♂ × Light Sussex ♀ cross. When the Rhode Island Red cock is mated to a Light Sussex hen, the dominant black neck hackle feathers and flesh-coloured legs of the mother appear in both sexes; but the white ground colour of the plumage of the female parent being sex-linked is transmitted to the males only among the offspring. The pullets are of the Rhode Island Red type, thus distinguishable from the time of hatching. For the data referring to sex-ratios of normal and control pens as also to egg size and production the P_1 individuals were employed. The growth rates refer to the same birds as those used to study the effect of thyroid feeding on the structure of the feathers.

Feathering.

Twelve chicks (six of either sex) were fed daily with wet mash to which 2 gr. of desiccated thyroid per individual was added. The activity of the thyroid preparation was tested by its power to induce metamorphosis in the Axolotl. Feeding commenced three months after hatching, and continued till the assumption of sexual maturity at the age of a little over seven months. The feathering of the ♂

had developed in the usual manner and provided no data confimatory of the account given by Horning and Torrey. Possibly our failure to confirm their conclusions is due to administering the extract too late in adolescence; but the cross chosen was a very slowly maturing one. There was no noticeable difference in the times at which sex maturity occurred in the experimental birds and in controls from the same hatch kept side by side in the open.

GROWTH.

In the accompanying tables is given the weekly growth for the control and the experimental pens which were kept in the open during the autumn months, and were fed on similar diet apart from the addition of thyroid substance in the latter case. Feeding commenced at the age of three months and continued until seven months.

TABLE I.

Experimental Pen.	Weekly Weight in Ounces.										Final Weight / Initial Weight
E 1 ♂	87·5	94·0	94·0	95·0	97·0	103·0	104·0	104·0	103·0	105·0	1·20
E 2 ♂	77·5	86·0	90·0	92·0	96·0	98·0	93·0	94·0	93·0	97·0	1·25
E 3 ♂	92·0	97·0	104·5	105·0	106·0	108·0	108·0	110·0	113·0	117·0	1·27
E 4 ♂	95·5	102·0	98·0	99·0	101·0	105·0	109·0	109·0	112·0	114·0	1·20
E 5 ♂	89·5	95·5	106·0	106·0	107·0	108·0	106·0	110·0	102·0	107·0	1·19
E 6 ♀	62·0	61·5	66·0	67·0	69·0	73·0	74·5	71·0	74·0	77·0	1·24
E 7 ♀	62·5	65·0	66·0	70·0	74·0	78·0	79·0	76·0	79·0	77·0	1·23
E 8 ♀	56·5	57·0	59·5	60·0	60·0	62·0	63·0	67·0	72·0	75·0	1·33
E 9 ♀	70·5	70·5	68·5	70·0	72·0	78·0	82·0	84·0	86·0	85·0	1·20
E 10 ♀	62·0	63·0	68·5	69·0	69·0	70·0	71·0	73·0	78·0	84·0	1·35

Control Pen.	Weekly Weight in Ounces.										Final Weight / Initial Weight
C 1 ♂	70·5	72·5	78·0	80·0	82·0	84·0	86·0	93·0	97·0	99·0	1·40
C 2 ♂	86·5	95·0	94·0	96·0	101·0	106·0	105·0	111·0	112·0	116·0	1·34
C 3 ♂	93·0	98·0	103·5	102·0	102·0	101·0	106·5	110·0	110·0	111·0	1·20
C 4 ♂	83·5	90·0	93·5	97·0	101·0	106·0	108·0	111·0	108·5	109·0	1·31
C 5 ♂	104·0	111·0	108·5	107·0	101·0	99·0	101·0	112·0	116·0	116·0	1·12
C 6 ♀	60·5	63·0	63·5	65·0	69·0	73·0	77·0	85·0	86·0	86·0	1·42
C 7 ♀	70·0	70·5	72·0	70·0	68·0	61·0	84·0	92·0	91·0	91·5	1·30
C 8 ♀	55·5	61·0	61·0	65·0	67·0	71·0	75·0	80·0	79·0	78·0	1·40
C 9 ♀	66·5	68·0	68·5	74·0	77·5	86·0	85·0	93·0	94·0	97·0	1·46
C 10 ♀	64·0	68·5	71·0	71·0	72·0	73·0	74·0	76·0	76·0	78·0	1·22

From the foregoing table the essential data may be summarised as under :—

TABLE II.

M.	Mean Percentage Final/Initial Weight.	Standard Deviation of Series.	Standard Deviation of the Mean of Series.
Thyroid ♂♂ M_a	122	$\sqrt{9·2}$	$\sqrt{1·8}$
Control ♂♂ M_b	127	$\sqrt{99·6}$	$\sqrt{19·9}$
Thyroid ♀♀ M_c	127	$\sqrt{34·8}$	$\sqrt{6·9}$
Control ♀♀ M_d	136	$\sqrt{78·6}$	$\sqrt{15·7}$

From this it appears that the males and females should not be treated as a homogeneous set, since, taking the standard deviation of the mean difference $(M_1 - M_2)$ as $\sqrt{\sigma_{m_1}^2 + \sigma_{m_2}^2}$ the difference between the means of the thyroid-fed birds is 2·3 p.e. The difference between the mean final/initial weight ratios of the controls and thyroid-fed females is 2·5 p.e., and the difference between the control and thyroid-fed males 1·6 p.e. This represents a very doubtful margin of significance, and cannot be interpreted with certainty as indicating a retardation of growth with thyroid feeding. However, such a result would not, in spite of the established action of thyroid administration in cases of infantilism, be repugnant to the conclusions of previous authors, among whom several have observed slight inhibition of growth through thyroid treatment of normal healthy individuals. (Magnus Lévy '95, Moussu '99, Bercher '10, Carlson, Rooke and Mekie '12, Hewitt '14, Cotroni, Romeis '15.) The data cited above suggest that cockerels mature (as regards growth rate) earlier than pullets. As, however, the stock was not homogeneous, it is not profitable to emphasise the possibility.

Egg Production and Size.

The following table is based on the egg production of two thyroid-fed pens of six hens each and of two control pens during the month of September (four weeks). In view of the negative character of the record, there is no reason to devote space to tabulating the actual weights of the 320 eggs which were weighed correct to the nearest centigram. We are indebted to Mrs. Hogben for summarising the facts with the appropriate statistical constants below :—

Pen.	Total Number of Eggs in Four Weeks.	M. Average Egg Weight (Grams).	Standard Deviation of Series.	Standard Deviation of Mean.
1 and 3 (Control), 12 hens	180	58·0	4·44	0·33
2 and 4 (Thyroid-fed), 12 hens	140	58·2	3·78	0·32

It is doubtful whether the diminished egg production of the thyroid-fed pens is significant, as several birds in both series became broody. In any case, there is obviously no significance to be attached to the small difference in egg-weight between the two series, which is actually less than the p.e. of the mean difference.

Sex-Ratio of Offspring.

The work of Riddle on pigeons and Seiler on moths encourage the anticipation that a disturbance in basal metabolism might affect

the chance of the X-chromosome passing into the polar body or remaining in the egg, and so modify the sex-ratio. For this reason the sex-ratios of eggs from control and thyroid pens (P_1) were recorded.

During spring, before the experiment, the sex-ratio was normal. Out of six hatches during February–June, 1922, the following figures were obtained :—

	Males.	Females.	Too Young to Sex.	Infertile.
Living	181	152	—	84
Dead-in-shell	63	82	28	—

This gives 244 males and 244 females of recognisable sex before or after hatching. If the remaining 28 zygotes are distributed in the proportion 63 : 82 as representative of the sex-ratio for dead-in-shell, the males and females are in the ratio 256 : 260. The difference of 2 from the mean is within the p.e. for sampling on the assumption of a 1 : 1 relation ($\sigma = \sqrt{npq} = \sqrt{516 \times \frac{1}{2} \times \frac{1}{2}} = 3$). As would be anticipated from Haldane's rule, the highest prenatal mortality occurs in the heterozygous (female) sex.

During August–September nine sittings of control birds gave 52 ♂♂ and 70 ♀♀ of recognisable sex before hatching, 38 dead-in-shell before the sex could be distinguished, and 44 infertile eggs. This gives a difference of 9 from the mean, or a deviation from the 1 : 1 ratio equivalent to two and a half times the p.e. due to sampling. It is likely that this represents a significant seasonal difference, especially if weighted with respect to the prenatal mortality of the sexes on account of the 19 per cent. individuals whose sex was not identifiable. Eight sittings of the thyroid-fed pens in the foregoing experiment gave the following : 75 ♂♂, 78 ♀♀ of identifiable sex before hatching, 88 dead-in-shell and indistinguishable, together with 52 unfertile eggs. The mortality was appreciably higher in these sittings (natural incubation as before), and the normal ratio (the deviation being well within the p.e. for sampling) may be due to a higher mortality of females. The gross figures are for control pens (August–September) 74·3 ♂♂ per 100 ♀♀, and for thyroid-fed pens (August–September) 96·2 ♂♂ per 100 ♀♀, estimated as totals of 122 and 243 individuals of recognisable sex respectively in the two series. Using the formula $\sqrt{pq/n}$ for the standard deviation of the proportion of males, the S.D. for the difference being therefore $\sqrt{\frac{pq}{n^2} + \frac{p'q'}{n'^2}}$, there is a high degree of probability that the difference between the proportion of

♂♂ in the thyroid and control pens is not due to errors of sampling. The interpretation which is to be attributed to the difference in the proportion of males cannot be inferred from these data, since the nature of the seasonal difference itself is obscure. It may be due to differential mortality.

The expenses incurred in this preliminary investigation were in part defrayed by a grant to one of the authors by the Government Grants Committee of the Royal Society.

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Clinical Articles

TWO ATTACKS OF TETANUS WITHIN EIGHTEEN MONTHS

BY M. DUGDILL, M.R.C.V.S.,
Patrington, Hull.

ON January 17, 1921, I received a message to see a mare in which I diagnosed tetanus. No sign of wound was to be found, and I injected anti-tetanic serum. Chloral hydrate was prescribed in the drinking water. She had recovered by the 9th of February, and was at work a fortnight later, working regularly until June 1922.

July 1st I received a message to see the same mare, as the owner thought she showed signs of lockjaw as before.

I found the animal showing distinct signs of tetanus. On this occasion there was a punctured wound on the near fore foot, which was cut out and dressed daily with antiseptics. Injected anti-tetanic serum and treated as before. She went to work about the middle of August, and have often seen her at work since when passing the farm.

The case is interesting on account of having tetanus twice and recovered each time.

Seven injections of anti-tetanus were given on the first occasion and ten the second time.

THE USE OF THE STOMACH PUMP IN HORSE AND CATTLE PRACTICE

BY C. G. HILL, M.R.C.V.S., AND R. BRISTOW, B.Sc., M.R.C.V.S.,
Darlington.

THIS instrument we have found to be of the greatest value in treating the following types of cases: (*a*) Colics; (*b*) emaciation;

(*c*) strongylosis; (*d*) auto-intoxication of cattle. The instrument used is that recommended by Captain Lang.

(*a*) It is our rule now never to go to a colic case without the pump. In cases of impaction it is, in our opinion, the best method of treatment. As a general rule we pump in from one to two buckets of warm water containing 8 ounces of salt and ½ ounce of formalin. Drugs such as ammonium carbonate and P. nux vomica may be added, but we find that these are only required in small doses. If the pain is acute, we generally add 1 ounce of chloral hydrate. Defæcation occurs in twelve to twenty-four hours and the patient has completely recovered. This early recovery is, we think, one of its great advantages over the hypodermic injection of arecoline. Using the latter we have found that the wall of the intestine is damaged, large masses of epithelium coming away with the fæces, and the patient evidences pain for thirty-six hours or so after the impaction has been moved.

When a "twist" is present the saline solution returns down the nostril, and when this occurs one may fairly safely diagnose "twist."

(*b*) Emaciation and debility can be effectively dealt with by pumping milk containing iron, etc., into the stomach on three or more consecutive days.

(*c*) *Strongylosis.*—Two or three times weekly irrigations with salt and formalin has a wonderful effect on these cases.

(*d*) *Auto-intoxication in Cattle.*—This condition may be effectively treated by pumping in water and siphoning it off, and repeating two or three times until the rumen is clean, and finally pumping in a good strong saline solution containing formalin, which is left in. In those cases due to potatoes, where the ingesta resembles brewers' yeast and the trocar is of no value, the pump is especially useful. In cattle the tube is passed by the mouth.

In conclusion we append some notes on the last four or five colic cases which have occurred in this practice.

Case I.—Bay mare. Salt and formalin were given at 10 p.m. No further treatment. Evidently spasmodic colic.

Case II.—Brown mare. Had had access to a clover field on the day previous and was bad all night. At 6 a.m. the tube was passed, and after five or six pumpfuls the solution returned by the nostrils. The pulse was hard and wiry and the mucous membranes ingested. Chloral hydrate (1 ounce) was given in a drench, and ammonium carbonate and nux vomica powders were left with instructions to give one every four hours. Death occurred at 2 p.m. Post-mortem showed a twist in the small intestine.

Case III.—Black mare. Dull and uneasy for twenty-four hours. After a rectal examination, subacute impaction of the pelvic flexure

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was diagnosed. Ammonium carbonate (1 ounce) was added to the saline solution, which was given at 11 a.m. The mare was tied up and no food given till the next morning, when she was quite normal and had passed an enormous amount of fæces.

CASE IV.—Black gelding. Pain was acute, and at 10 a.m. saline was given with ammonium carbonate and chloral hydrate added. Ten p.m. the patient was normal.

CASE V.—Bay gelding. Six p.m., temperature 100° F., pulse 60, respirations normal. Saline was given with ammonium carbonate and nux vomica added. Twelve p.m., temperature 102° F., pulse 84, respirations 20, and the mucous membranes ingested. Rectal examination showed the contents of the large bowel to be very hard and dry. Chloral hydrate (1 ounce) was given in a drench. Nine a.m., patient normal and eating a bran mash, but no movement of the bowel. Six p.m., patient very hungry, but still no defæcation. Another bucketful of saline was administered by the tube, but this was not really necessary as the bowels moved as soon as the pumping was finished.

CASE VI.—Strongylosis in a three-year-old Clydesdale colt. Last year the colt was brought in from grass in an emaciated condition, practically skin and bone, suffering from acute diarrhœa and passing hundreds of *Strongylus armatus* and *tetracanthus* worms. The colt refused all food and liquids. We fed him for a week daily by the pump with gruel, milk and eggs, treating him with formalin, sodium chlorate, and iron. He made a wonderful recovery, and is in splendid condition at the present time. The stomach pump undoubtedly, in our opinion, saved this colt's life.

A PECULIAR EYE LESION IN THE HORSE.

BY CAPTAIN T. L. SHEA, R.A.V.C.,
Melton Mowbray.

WHILST examining some horses last week I came across a most (to me) unusual condition of the eye. The subject was a six-year-old riding horse that had apparently done little work. The off eye showed, on examination with the ophthalmoscope, a number of filaments somewhat intersecting one another floating apparently in the vitreous humour.

The condition gave the impression of a spider's web being swayed by the wind, partially occluding the view of the retina.

There was no doubt that the lesions seriously imparied the vision of the animal, because I particularly noticed that alertness and

peculiar poise of the head which is characteristic of animals suffering from defective vision.

In the last eighteen months I have examined over 2,500 horses, and have never seen a condition like this. I should be most interested to know of similar cases.

CUTANEOUS HÆMORRHAGE IN CATTLE

By B. DORASWAMY IYENGAR, G.M.V.C.,
Veterinary Inspector, Hyderabad, Deccan, India.

LAST year, when I was on tour in the districts, two bullocks were brought to me for treatment, with the complaint that they were bleeding from their skins; and that, at times, the bleeding was very profuse. The history went to show that they had started bleeding in that way some weeks before. At one time the hæmorrhage would break out in one place for about an hour or so, and then it would stop, to start afresh in another place. Often-times the ground on which the animal stood was soaked with blood, and the condition of the animal caused anxiety to the owner.

The two animals that I saw were bleeding, one at the neck, and the other at the side. Nothing abnormal could be seen except a raised bleeding centre.

Diagnosis.—It occurred to my mind that it was the havoc played by the *Filaria multipapilosa.*

Treatment.—I administered 2-ounce doses of liquor arsenicalis once a day for a week, and the animals recovered. The object of the arsenic was to poison the worm which I believed to exist.

It is now twelve years since I left the college, and it was then taught that this filaria was to be found only in certain countries, and only to affect the equine species. I had not seen any case either in the college or outside till last year. May not this *Filaria multipapilosa* infest the cattle also? In that part of the country where I travel as Veterinary Inspector I hear that cattle often suffer from this complaint, and I am making inquiries on the subject. Will any of your readers kindly inform me through the medium of your Journal if they have seen such cases and what treatment they have adopted.

POST-PARTURIENT BLACK QUARTER

By L. J. KELLY, F.R.C.V.S.,
Ballybrophy, Queen's County, Ireland.

THREE cases of black quarter affecting cows and occurring within a short period after parturition are recorded hereunder. The animals affected were in each case primapara heifers of two and a half to

three and a half years. The act of parturition was in each case a normal one and accomplished without assistance; in Cases 1 and 3 it occurred in the open field. The farms where these animals became affected are not "black-quarter farms." On only one of them had a case occurred previously, and that was ten years ago amongst calves.

Considering the period which elapsed between parturition and the onset of symptoms one must infer that the infection occurred at the time of calving or shortly after that act.

CASE I.—In January 1921 a two-and-a-half-year-old heifer had calved five days previously. It was said by the owner to have been an easy parturition and had taken place in the open field. The calf was alive and well. At the time of my first visit I found this heifer in evident pain and distressed. She was made to rise with difficulty. There was a high temperature; rapid respirations. She was stiff posteriorly and much inclined to resume the recumbent position. The inner commissures of the vulvæ labia were bruised, and there was even evidence of superficial necrosis thereon, as might of course occur in a normal parturition. The uterus contained a small quantity of malodorous material, which was swabbed out and an antiseptic pessary was inserted. Puzzled to account for the clinical picture, I was inclined to conclude that the trouble lay in the womb, and decided to return to the case later that day with the intention of more thoroughly irrigating the womb. At my next visit, some six hours later, it was obvious that the difficulty in progression was confined to the right hind limb, and that there was a great enlargement involving the muscles of the croup and thigh of that limb. Manipulation of this area revealed the typical crackling, crushing sound and impression associated with a black-leg lesion. By way of treatment and to further establish the diagnosis I made several long deep incisions into the tumefaction and removed large areas of the affected muscles, and by further incisions allowed much of the tarry, frothy, sanguineous material to escape. The patient, though perfectly conscious, was insensible to this operative procedure, and was apparently somewhat relieved thereby, as evidenced by the less rapid respirations and uneasiness which followed for a time. This patient died some ten hours later. To convince a sceptical owner, who not unnaturally only considered black quarter as a malady of young calves, and to satisfy myself, I took some of the affected muscle and had it submitted to bacteriological examination, which examination confirmed the conclusions already made.

CASE II.—In April 1922 a two-and-a-half to three-year-old heifer in fair store condition had calved six days previously. On the night prior to me seeing her she was considered unwell. On the next

morning she was unable to rise. The owner, believing she had milk fever, requested my attendance. There was a temperature of 103° F., and the general clinical picture was somewhat similar to that as described in Case I. The animal was unable to rise. The uterus was normally involuted, the cervix was closed, there was no vaginal discharge. For further inspection she was turned over, and it was then apparent that this was another case of black quarter, practically all the muscles of the right thigh being affected. Several incisions were made into the area involved, allowing the typical dark sanguineous material to escape, and several injections of a solution of potassium permanganate were made into the swelling at different places. The animal also received alcoholic stimulants and subcutaneous injections of camphor oil. She died some six hours after my first seeing her.

DYSTOKIA. AN IMPOSSIBLE CASE TO DELIVER.*
"And the bailiff wondered why I asked for a gun."

CASE III.—January 1923. A two-and-a-half-year-old heifer had calved three days previously in the open and without assistance. She was rather poor in flesh and presented symptoms somewhat as already described for other cases. The placenta was retained and was malodorous. The uterus contained also a quantity of fœtid material. The extremities were cold, the temperature was subnormal, and the patient was evidently collapsing. With difficulty she was made to rise, and it was then noticed she had difficulty in moving the left hind limb. A little closer inspection revealed an enlargement a little

* This photograph was contributed to the VETERINARY JOURNAL by Mr. Walter Western, M.R.C.V.S., Bracknell, with the terse phrase appended herewith.

in front of the external angle of the ilium, which on manipulation gave the typical impression of a black-leg lesion.

For treatment some normal saline solution with tincture of iodine was injected into the swelling at several points. The patient died on the same day.

TWO INTERESTING UTERINE CASES

By M. DUGDILL, M.R.C.V.S.,
Patrington, Hull.

Case I.—I was called to see a cow which had been in pain for several hours before I was called in. Upon vaginal examination I found it impossible to introduce more than one finger, and I could feel a distinct twist. I cast the animal and had the body rolled over whilst I kept my hand and arm in the vagina, but at first I could make no impression. Having little help, I left the womb to itself and helped with the ropes. After swinging her to and fro several times we turned her sharply over, and I then found that I could introduce my hand easily. It was a pleasant surprise, and the calf was delivered alive without further trouble.

Case II.—Sow, everted uterus, seven miles away. Sunday evening; not a pleasant job. On arrival found animal had ruptured organ rubbing against wall of sty. Put on double ligature and amputated. Sow made good recovery, brought up seven young pigs and was fed. Unfortunately did not see carcase when killed, as animal was sent to market.

IMPERFORATE ANUS IN PIGS

By L. J. KELLY, F.R.C.V.S.,
Ballybrophy, Queen's County, Ireland.

Case I.—The subject was a young male pig, fourteen days old. The owner had noticed him much swollen since a few days previously and requested my attention. On examination it was observed that there was no anal opening. Without much difficulty an artificial opening was made and the patient did well. The length of time which elapsed between birth and the first passage of fæces renders the case of sufficient interest to record.

Case II.—The subject was a young female pig. When about three weeks old the attendant observed that fæces were passed through the vulva, there being no other natural opening. The animal was apparently in good health and as strong as others in the litter. Surgical interference was not deemed advisable. When ten weeks old the subject was sold as a "sucker" with the remainder of the litter and lost for further observation.

AT WHAT AGE MAY PUPPIES DEVELOP TUBERCULOSIS?

By HENRY GRAY, M.R.C.V.S.,
Earl's Court, S.W. 5.

I HAVE seen numerous cases of tuberculosis in the dog and cat, in which its manifestations are manifold. But until a year ago I never observed a case of infantile tuberculosis in the canine species. It was in an Irish setter pup, *five weeks old*, brought for a post-mortem examination a few minutes following its death. It was, on judging the exterior, in a fair condition, but, on opening the chest and abdomen, the lesions were those of generalised tuberculosis. The glands were very much enlarged. This puppy had nothing but its mother's milk to sustain it.

Now, was this a case of congenital tuberculosis? Sir John MacFadyean was not disposed to accept it as such. Was the dame tubercular? Did she ingest tuberculous food and then give her pups the disease through her milk? Did it contract the disease from a human being living in the house in which it was kept?

One other pup was destroyed later in consequence of meningitis of the noisy type, probably of distemper origin. Lesions of tuberculosis were found by Sir John MacFadyean.

A third pup was, shortly after the second case, destroyed by another practitioner, who did not make a post-mortem, and probably knew nothing of the history of the case.

The dam, beyond showing chorea, is apparently healthy. Her litter brothers and sisters died mysteriously—one, it is said, after being tapped for pleurisy! But I found it was impossible to get a reliable history of the causes and natures of the deaths of this dam's relations and antecedents.

TENACITY OF LIFE IN A DOG

By W. H. WOOD, M.R.C.V.S.,
Blackpool.

ON July 21st I had a dog brought to me for destruction which had been run over by a motor in the early part of January, and since then had become irritable and snappish. After destroying him I held a post-mortem, and found the following condition present: The entire bowel from the pylorus to the rectum had been forced through a rupture in the diaphragm with the exception of a straight tube leading from the aperture in the diaphragm to the anus. The rupture was in the right superior region of the diaphragm, and easily accommodated the two sections of bowel passing through it. The bowel in the chest cavity extended along the entire floor and right side, thus displacing the heart and lungs superiorly to the left. It was

remarkable that the dog had lived so long in this condition. The principal symptoms, apart from the altered disposition of the dog, were distress on exertion and frequent vomiting.

CRYPTORCHIDISM IN CATS

By FREDERICK HOBDAY, F.R.C.V.S.,
London, W.

Judging from some remarks made at a recent meeting* of the Central Branch of the National Veterinary Association, one might justifiably consider that cryptorchidism in the cat was of somewhat rare occurrence. That this is not the case can, however, be readily verified by reference to any practitioner who is engaged in a small animal clinique where large numbers of cats are brought annually for castration. The malplacement of one testicle is of quite common ocurrence, and the inability to observe either in the scrotum does not cause any great surprise to the practitioner. Sometimes one or both are to be found subcutaneously in the inguinal region, or it may be that there is no external visible evidence of either, and they are eventually found lying free in the abdomen.

In the absence of symptoms of sexual desire, the fact that a testicle (or testicles) are present somewhere can be verified by the curiously offensive uriniferous odour which accompanies the urine, and which hangs about the hair and surroundings (especially in Persian and other long-haired breeds) of the preputial region.

The heredity of cryptorchidism is beyond question, and it is interesting to note that observation has proved that it can be transmitted through the females.†

The following case, selected from a number of others, is typical:—

A valuable pure-bred Persian kitten, aged fifteen months, which had been in the possession of the owner since it was six weeks old, was brought for castration, the reason being stated that, although of clean habits, its urine (when passed into a tray kept in a corner of the room) was offensive and objectionable. No attempt at castration had ever been made. Examination revealed the absence of testicles externally, but the hair around the prepuce had the characteristic odour of the male cat, and the head was well developed like that of the uncastrated "Tom." Under the anæsthetic influence of A.C.E. mixture the abdomen was opened and the testes were readily found, lying free amongst the intestines, and removed. The patient made an uninterrupted recovery, and the urine became odourless forthwith.

* July 12, 1923 (*Veterinary Record*, August 18, 1923).

† *Castration (including Cryptorchids and Caponing) and Ovariotomy* (published by Baillière, Tindall & Co.), pp. 39 and 84.

Abstracts of Current Literature

Meyer.—A Contribution to the Spread and Significance of Fowl Coccidiosis.—*Deutsche Tierärztliche Wochenschrift*, 1922, No. 15.

Fowl coccidiosis is a widespread disease of young birds due to *Eimeria avium*, or its varieties. In most cases it appears as an enzootic causing many deaths, even up to 70–90 per cent., or the invasion predisposes to other diseases such as worms and bacterial infections. By extensive destruction of intestinal epithelium in the small and blind gut (cæcæ) it causes severe injuries, which are denoted by catarrhal and hæmorrhagic inflammation, and nodes and swellings and toxic effects are produced by the protozoa. Clinically, this parasite produces chalky or slimy and often bloody diarrhœa, salivation, stupor, and loss of appetite. Young birds frequently die without symptoms of illness. Recovered birds are carriers. The infective agents (oocysts) are passed in the excreta of sick birds; sporulation develops, but only in the presence of oxygen, as in the intestine, and in sufficient moisture and favourable temperature. When the oocysts gain access with the food or drinking water into the intestinal canal of a susceptible animal, the enclosed sporozites free themselves and actively penetrate into the epithelial cells of the intestine, where endogenous propagation occurs, which concludes with the formation of oocysts. Proof of the coccidia may be obtained by staining with Giemsa or by placing in concentrated solution of salt.

Causes and Treatment of Sterility in Cattle.—*Schweizer Archiv für Tierheilkunde*, March, 1923.

Professor J. Richter, of the Dresden Veterinary School, has investigated 100 cases of sterility in cattle, and produced a little book on the subject. In the blood examination for abortion 45 per cent. gave a positive and 55 per cent. a negative reaction. On many holdings all the animals reacted positively without abortion having taken place. Contagious abortion has a considerable, if not a complete, significance in the etiology of sterility. Infectious catarrh of the vagina is of small importance. Of 100 cases examined only 2 were thus affected. Other anomalies of the vagina are not very prevalent (fleshy folds, cysts, strictures, hymen). Only 5 out of the 100 cases had anomalies of the vagina as a cause. On the other hand, 72 per cent. showed diseases of the uterus. Inflammatory signs at the cervix were present in 32 per cent. of cases. In only 3 of the cases were the changes limited to the os and a cause of primary sterility. The diagnosis of endometritis was made in 59 per cent. of cases. There were 10 cases of fluor albus, 27 of chronic catarrhal

and purulent endometritis recognized through the open cervix, and increased discharge of mucus mixed with flakes of pus. In 6 cases there was tuberculosis of the uterus, and 2 of the cases also had t.b. of the Fallopian tubes and ovaries.

Twenty-eight of the 100 cows showed abnormalities of the ovaries, 7 inactivity due to under nourishment, 17 persistent yellow bodies, 4 cysts. The treatment of sterility must be chiefly directed to the uterus. It consists of irrigation with physiological salt solution, afterwards Lugol and electrolysis. The ovaries are treated by pressing out the persistent yellow bodies and crushing the cysts. As a result of treatment two-thirds of the cases can be cured. Only by renewed observations, statistical examinations, and recorded experiences can the knowledge of this matter of sterility be further advanced.

Stange, G.—Fracture of the Scapula in a Heifer.—*Berliner Tierärztliche Wochenschrift*, June 29, 1922.

FRACTURES of the scapula being rare, notably in bovine pathology, Stange has decided to publish the following :—

On April 18th a heifer made a 25-kilometre journey over slippery ground. She fell, and was unable to rise. The heifer was taken in a float to the nearest village. Stange got her standing up, but she put no weight on the left foreleg. Examination showed abnormal mobility, no crepitation, and no swelling. If the forearm was pulled forward and the hand placed across the leg above the scapulo-humeral articulation, a notch could be found, in the depth of which there was a resistant and hard knob. He diagnosed a fracture of the neck of the scapula and ordered slaughter.

Autopsy.—Fracture of the neck 3 centimetres above the glenoid cavity. The articular capsule was torn : the synovial sac enclosed several fragments of bone spread around the articulation.

Lichtenstern, G.—New Treatment of the Nervous Form of Distemper.—*Deutsche Tierärztliche Wochenschrift*, June 24, 1922.

LICHTENSTERN'S treatment is based on the fact that old dogs do not contract distemper, which proves that the blood of these dogs contains anti-bodies capable of hindering the evolution of the malady.

For this reason he uses the blood of old dogs in the treatment of distemper. Old dogs brought for slaughter are bled white, and the blood is collected and 10 per cent. of a sterile solution of citrate of soda added to it. The dogs to be treated receive 100 to 500 grammes of the citrated blood as a subcutaneous injection at the neck and shoulder. According to Lichtenstern, the results are surprising. Affected dogs with grave nervous symptoms, prostrate on the ground, get up the second day after injection, walk easily, and improvement

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is so marked that after a few weeks the weakness of the hind extremities disappears completely.

Biessy.—Treatment of Necroses and Caries by Essence of Turpentine. —*Revue Vétérinaire*, May, 1922.

ACCORDING to M. Biessy, essence of turpentine is far superior to the majority of therapeutic agents in the treatment of wounds of fibrous, cartilaginous, and osseous tissues. To avoid the irritant action of this substance on the neighbouring skin, it is incorporated in almost equal quantities of wax or resin ; a soft paste is thus obtained with which cotton wicks are impregnated and introduced into the fistulas until in contact with the carious or necrotic tissues. As a result there is rapid elimination of the diseased parts, which are replaced by healthy granulations. Cicatrisation is then obtained with the usual antiseptics. The author by these means has effected early cures of fistulous withers, poll evil, and quittor.

Frasey.—Operatory Method of Transfusing Blood in Large Animals. —*Revue Vétérinaire*, March, 1923.

THIS technique necessitates the use of two of the trocars used in bleeding, an india-rubber tube 4 to 5 feet long, with a glass tube about 7 inches long in its middle, and finally 2 metallic plugs or screws to enable the india-rubber tubing to be fixed on to the canula of the trocar. All parts of this material must be quite sterile. The giver of blood having been fasted, the two subjects are placed about 2½ feet apart. An incision is made with a bistoury at the usual place for bleeding in the right jugular furrow of each animal. The trocars are then inserted from above to below into the jugulars of giver and receiver. The giver is then fed. The mandril is then withdrawn from the trocar and the india-rubber tube fixed : as soon as the blood flows to the other extremity one withdraws the trocar from the canula in the receiver and fixes the tubing on to the canula. It takes about ten minutes to make a minimum of 10 pints of blood to pass from one animal to the other.

Césari.—Some Remarks on Cancer in the Horse.—*Revue Vétérinaire*, March, 1923.

THE author has made a systematic research on epithelial tumours among 40,000 horses inspected at the horse abattoir at Decroix. The number of cases of cancer observed has been 184. The percentage varies according to the sexual condition of individuals. Cases of cancer have been 6 times more frequent in entire horses than in geldings, 3½ times more frequent in stallions than in mares, and 1½ times more frequent in mares than geldings. These differences

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are due to the extraordinary frequency of cancer of the testicle in entire horses and to the less frequency, but yet considerable, of cancer of the udder in the mare. The localisation which comes next is cancer of the kidney, above all frequent in geldings, then cancer of the intestine and bladder (mares). A light-coloured skin appeared to favour cancer of the testicle and udder. The greater part of the observations were made on subjects more than twelve years old.

Linden, M. von.—Treatment of Parasitic Broncho-Pneumonia (Strongylosis) with Copper Compounds.—*Bulletin de l'Institut. internat. d'agric.*, Rome, May, 1921.

After ten years' experience in the treatment of this disease the author publishes the following:—

Curative Treatment.—Based on soluble copper salts, administered by the digestive tract or by intravenous or intro-muscular injections.

By the digestive tract chloride of sodium is used, to which is added 1 per cent. chloride or sulphate of copper. The doses of this mixture are:—

Cattle above six months . .	10 grammes per head a day in food or drink.
Adult swine	
Cattle under six months . .	5 grammes per head a day.
Sheep and goats	

The treatment should last four to six weeks. To avoid recurrences it is well to continue the use of the mixture twice a week for a longer period, especially if the malady shows an endemic form.

By intravenous or intramuscular injections of 5 per cent. dimethyl-glycocollate of copper very bad cases have recovered. The author treats cattle by injecting into the muscles of the croup twice a week, and alternately on the right and left, 10–15 c.c. of a 5 per cent. solution. On an average each animal has received 8 to 10 injections.

Prophylaxis.—(1) Exclusion of animals from contaminated regions and showing cough or diarrhœa.

(2) If possible, manure the pastures several times a year with dephosphorised slag or the liquid manure derived from horses.

(3) If the malady is to be feared, administer the copper mixture twice a week to all animals.

Ball, Dr. V.—Hypertrophy of the Thymus—Its Importance in Surgery —Thymic Death.—*Revue Vétérinaire*, No. 3, March, 1923.

In animals, especially if young, as in children and adults, certain cases of sudden death ought to be ascribed to hypertrophy of the thymus, and the surgeon should bear this in mind.

According to general opinion in man, the thymus is subject to

atrophy at the commencement of puberty. In certain adult animals a well-developed thymus may be met with, and more so in young subjects, alone or associated with *thymico-lymphatic dyscrasia*. Under this name Paltauf in human medicine has described a special state characterised by hypertrophy of the thymus, of the spleen, lymphatic organs, and lymphoids, with leucocytosis and hypoplasia of the suprarenal capsules and endocrine glands. Hypertrophy of the thymus in the human subject, apart from evident signs (permanent or intermittent dyspnœa, cyanosis of the veins of the face, dilatation of the neck veins, or troublesome deglutition), may often declare itself by sudden death. This may happen as a result of screaming, dancing, coitus, hyperextension of the head, examination of the throat, immersion in cold water, and finally and above all in the course of general anæsthesia.

The author has met with some cases in dogs and cats of simple hypertrophy of the thymus, or with it in association with the status lymphaticus. In dyscrasic subjects he has also found hypertrophy of the spleen with voluminous corpuscles of Malpighi.

In a young dog with convulsions of parasitic origin and found dead he discovered a thymus much hypertrophied.

Theories as to death from status lymphaticus are: that the condition causes a less resistance to external excitement and intoxications. Subjects are fat, and hypertrophy of the lymphatic follicles at the base of the tongue has been considered an important sign of dyscrasia.

A second theory is that the hypertrophied thymus over-secretes and causes over-excitability of the nervous centres of the heart and hypotension by action on the sympathetic.

A third theory is that the hypertrophied thymus exercises compression on the trachea, large vessels, the heart and nerves; and a fourth opinion is that infiltration of lymphocytes into the myocardium interferes with the heart's action.

Wirth, Prof. Dr. D.—Poisoning of Horses by "Mercurialis Annua"—Hæmoglobinuria.—*Wiener Tierärztlich Monatschrift*, July, 1923.

Four horses were brought to the clinic suffering from mercurialis poisoning. They had been fed for two days on green food (stated to be vetches and barley) and showed brown-coloured urine. Examination revealed slight fever, jaundice, pulse and breathing increased (52–18), diminished peristalsis, accumulation of food in the large colon, great straining on rectal examination. Urine was dark brown or reddish brown and alkaline, had a specific gravity of 1035 to 1346, and contained albumen and hæmoglobin, but no pathological cellular

elements. On the third day the worst case still showed traces of hæmoglobin in the urine, but the other horses exhibited none. In blood taken from the jugular of the worst case a dark cherry-red colour was apparent, and hæmoglobin containing serum was deposited.

Examination of the food showed that about one-third of it consisted of *Mercuralis annua*, and further that ¼ was barley, ¼ vetches and ⅛ charlock (*Sinapis arvensis*). The owner reported that as a result of the dry season almost half of his vetches field had contained mercurialis, whose poisonous qualities were unknown to him, but several cattle in the neighbourhood had been ill.

A month later two more horses came to hand with black-coloured urine, and showing signs of illness. The urine was alkaline, specific gravity 1044, and contained quantities of albumen and hæmoglobin, but no pathological cellular elements in the sediment. One of the horses had eaten a deal of straw which contained 90 per cent. of *Mercuralis annua* in an imperfectly dry state. In these cases by the benzidin test hæmoglobin was proved.

Fröhner and Hoffman state that bloody urine is common in mercurialis poisoning. Hoffman says: "The red colour of the urine does not depend on red blood corpuscles or hæmoglobin." An experimental case made by Stütz is commented on as probably due to the red, indigo-like colouring matter of plants.

These cases of poisoning by *Mercurialis annua* show that the colour of the urine is brought about by a pure hæmoglobinuria, and that in one of the cases also there was a high degree of hæmoglobinæmia, as shown by the dark cherry-red colour of the serum.

Bedel, M.—Bovine Intoxication caused by Ingestion of Apples.—*Revue Vétérinaire*, July, 1923.

DRUNKEN cattle are chiefly seen where a herd gains access to heaps of apples, or where windfalls exist in great abundance. Where they get a few daily they seem less fond of them than where they suddenly come across an abundant supply.

Some hours after ingestion of the fruit the walk becomes uncertain and staggering, the eye is dull, the appetite suppressed, rumination suspended, there is no borborygmus. Rectal temperature is about 101·2° F. The degree of intoxication depends on the amount of apples ingested and the ripeness of the fruit.

The head is carried low. The look is stupid. The animals have great difficulty in standing up and stumble repeatedly. It may happen that they go down in sternal decubitus, inert, and comatose. Excrement contains the pippins. Sometimes there is a fœtid diarrhœa, strong odour in the urine recalling that of the residues in cider distilleries.

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Slight intoxication disappears as a rule in 24 hours, but the badly affected cases last 48 or more. It may be 36 hours before some of them get up.

Cure results as a rule. In over 100 affected animals there were no deaths. Treatment was giving 2 or 3 litres of strong coffee daily. In those badly affected a dose of acetate of ammonia was added night and morning. The author considers that this is an acute alcoholic intoxication, and that the ripe apples are commencing an alcoholic fermentation, and that this fermentation continues in the rumen, which becomes a veritable fermenting vat.

THE HIGHLAND SHOW

RESEARCH IN HORSE DISEASE.—JOINT SCHEME OF INVESTIGATION.

Grass Sickness.

MR. W. H. GILL, Tomich, asked the directors for the latest information with regard to grass sickness in horses, a disease which had been so serious last year, and was increasing this year.

Sir Hugh Shaw Stewart said they all recognised the seriousness of this matter, and it was some years since the Society had taken it up. He thought it was at the instigation of the veterinary profession that they moved, and they appointed their consulting chemist to act with a bacteriologist and make inquiry into the disease. Some time after this investigation was going on, a new and very important department was set up—the Animals Diseases Research Association, of which many of them were members and cordial supporters, and they properly turned their attention to this important subject. The more people who investigated this matter, the more likely they were to ascertain the root of the trouble. They had done their utmost to make the investigation as complete as possible, and that investigation was now drawing to a close, as far as the Highland Society was concerned. They all wished well to the investigation by the Animals Diseases Research Association, but that Association was started some years after the Highland Society's investigation.

Mr. F. L. Wallace, of Balcairn, said they would all be interested to know that at the instigation of Sir Stewart Stockman a joint scheme of investigation had either been started or was on the point of being started between the Ministry of Agriculture Research Institute at Weybridge under Sir Stewart Stockman and the Veterinary College in London under Sir John MacFadyen, and the Animals Diseases Research Association, with Professor Gaiger. Only last night, he said, Dr. Tocher gave him his permission to write and tell Sir Stewart Stockman that he gladly placed the whole of

his information and the results of all his experiments at the disposal of Sir Stewart Stockman and for the benefit of this joint investigation. Therefore, the work which had been done would be built upon and furthered. The field was only partially explored. There was a great deal more ground to be explored, and whether the theories of Dr. Tocher or Mr. Buxton were right or not, their work would not be lost. This was a big joint investigation. The people in England, he was sorry to say, were becoming as much interested in that question as they were in Scotland, because they had grass sickness in the Eastern Counties of England, and he believed, it was spreading. Therefore he wanted them to understand that there would be co-operation and a joint investigation, in which all Dr. Tocher's and Mr. Buxton's work would be fully made use of.

Mr. Gill said they all recognised the great seriousness of the situation, and they were glad to see the directors held the matter so well in hand.—*The Scotsman.*

ROYAL SOCIETY OF MEDICINE: A COMPARATIVE SECTION

At a recent General Meeting of the Fellows of the Royal Society of Medicine, held in the Society's Buildings, 1, Wimpole Street, W., the formation of a Section of Comparative Medicine was finally decided upon, and the following gentlemen were elected as the first Members of Council:—

President:

The Right Hon. Sir Clifford Allbutt, P.C., K.C.B., M.D., F.R.S.

Vice-Presidents:

Major-General Sir Layton Blenkinsop, K.C.B., C.M.G., A.V.S.
Lt.-Colonel J. W. Brittlebank, C.M.G., D.V.S.M., R.A.V.C.
Sir William Hale-White, K.B.E., M.D.
Frederick T. G. Hobday, C.M.G., F.R.S.E.
Lt.-General Sir William Leishman, K.C.M.G., C.B., M.B., F.R.S., A.M.S.
Major-General Sir John Moore, K.C.M.G., C.B., A.V.S.
Lt.-Colonel Sir Leonard Rogers, C.I.E., M.D., F.R.S.
G. H. Wooldridge, M.R.I.A.

Other Members of Council

Andrew Balfour, C.B., C.M.G., M.D.
Aldo Castellani, C.M.G., M.D.
Stewart R. Douglas, F.R.S.
L. S. Dudgeon, C.M.G., C.B.E., F.R.C.P.
George S. Dunkin, D.V.H.
G. Dunlop-Martin, M.R.C.V.S.
W. Hamilton Kirk, M.R.C.V.S.
G. H. Livesey, M.R.C.V.S.
J. W. McIntosh, F.R.S.E.
G. P. Male, M.R.C.V.S.
Sir D'Arcy Power, K.B.E., F.R.C.S.
Major-General W. Dunlop Smith, C.B., C.M.G., D.S.O., A.V.S.
C. F. Sonntag, M.D.
Walter G. Spencer, O.B.E., M.S.
Sir William Willcox, K.C.I.E., C.B., C.M.G., M.D.
Lt.-Colonel A. J. Williams, D.S.O., R.A.V.C.

Representative on Library Committee:

Frederick T. G. Hobday, C.M.G., F.R.S.E.

Representative on Editorial Committee:

J. B. Buxton, D.V.H.

The following dates are reserved for Meetings of the Section.
Extra Meetings may also be held on other dates.
Meetings are held at 5 p.m.

1923	..	*Wednesday*, October	24	1924	..	*Wednesday*, February	27
,,		,, November	28	,,		,, March	26
1924	..	,, January	23	,,		,, May	28
							(*Annual*)

ADRIAN STOKES, D.S.O., O.B.E., M.D.,
Pathological Department,
Guy's Hospital, S.E. 1.
J. B. BUXTON, D.V.H.,
National Institute for Medical Research,
Mill Hill, N.W. 7.
} *Hon. Secs.*

The Section is formed especially for the discussion of problems of mutual interest to those who study the diseases of animals and man, and it is intended that the official positions shall be equally divided between medical men and veterinarians, the Presidentship alternating in this way each year.

A calendar containing particulars of membership can be obtained from either of the Secretaries or from Sir John McAlister, the General Secretary of the Royal Society of Medicine, 1, Wimpole Street, London, W.

The Library contains over 100,000 volumes, and any obtainable book, not already in the Library, is procured on the request of a Fellow. Eight books may be taken out at one time on application to the Librarian.

Personal

Amongst those who have recently received Masonic honours we notice the name of Colonel E. K. Walker, C.I.E., O.B.E., F.R.C.V.S., Principal of the Punjab Veterinary College, who has been given the rank of Past Grand Deacon, England.

Colonel Walker has also been nominated a Fellow of the Punjab University and appointed to the Faculties of Science and Agriculture. There is reason to hope that a Veterinary Faculty will shortly be created in this University.

Obituary.

THE LATE DR. WRAY, D.V.S., U.S.A.

It is with deep regret we report the death of Dr. Wray, Veterinary Officer to the Bureau of Animal Industry, U.S.A., which occurred at his residence, "Maryland," Beaconsfield, Bucks, on August 24th, after only three days' illness. He was buried on August 27th in Beaconsfield Cemetery, in the presence of many friends who came to pay their last respects.

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Dr. Wray had been in the service of the Bureau of Animal Industry for about forty years, and was due to retire next January. He came to this country thirty-three years ago.

At first some of those in authority rather objected to an official being sent from the U.S.A., but Dr. Wray's tactful manner, together with the obvious honesty of his opinions, soon disarmed any resentment, and in a few weeks things were working smoothly and his views were always listened to with respect.

During the time that the U.S.A. cattle were arriving in thousands Dr. Wray became well known to all buyers, and latterly, when only a few cattle were arriving at our ports, he had a lot to do with pedigree stock breeders, as it was his duty to test all pedigree stock intended for exportation to the U.S.A. In this work he was an acknowledged authority.

The Bureau of Animal Industry has lost a capable officer, one whose place it will be difficult to fill, and our sympathies are extended to the Department as well as to his wife and relatives.

J. B. N.

Notice

We are informed by Messrs. Baillière, Tindall & Cox that the price of Captain Hamilton Kirk's book on *Canine Distemper* has been reduced from 10s. 6d. to 7s. 6d., and Robertson's Meat Inspection from 18s. to 10s. 6d. This is entirely in accordance with their present policy of reducing the cost of their publications wherever possible to meet the changed economic conditions. For instance, General Sir Frederick Smith's *Veterinary Physiology* was recently reduced from 35s. to 25s., and Professor Share-Jones's *Surgical Anatomy of the Horse* from £3 6s. in four volumes to 31s. 6d. in two volumes.

NOTICES

All communications should be addressed to 8 Henrietta Street, Covent Garden, London, W.C.2. Telephone: Gerrard 4646. Telegrams: "Baillière, Rand, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Manuscript—preferably typewritten—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown ink on white paper or card.

Copy of advertisements should be in the hands of the publishers—Baillière, Tindall and Cox—not later than the 25th of the month, or if proof is required, not later than 23rd.

Annual Subscription, 21s. ($5.00 U.S.A. currency) post free.

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